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KATTEN MUCHIN ZAVIS ROSENMAN 575 MADISON AVENUE NEW YORK, NY 10022-2585			ZERVIGON, RUDY	
			ART UNIT	PAPER NUMBER
			1763	
DATE MAILED: 12/15/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/807,589

Applicant(s)

PRETI ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: Claim 1 recites "the baffles having a length". It is uncertain which length, of three, Applicant refers.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 1, 2, and 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conger, Darrell R. (US 4,761,269 A) in view of Tomoyasu, Masayuki et al. (US 5,888,907 A) and Pozzetti, V et al (EP 415191 A). Conger, Darrell R. et al teaches a reaction chamber (Figure 5; column 7, line 48-68) comprising a belljar ("quartz dome", 112; Figure 5; column 5, line 54 - column 6, line 14) made of insulating and transparent material, such as quartz, a susceptor (114; Figure 5; column 5, line 54 - column 6, line 14) provided with disk-shaped cavities (holding substrates 14; Figure 5; column 5, line 54 - column 6, line 14) for receiving wafers (14; Figure 5;

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column 5, line 54 - column 6, line 14) of material to be treated and having an insulating and chemically resistant plate (lower portion of “quartz dome” above 114; Figure 5; column 5, line 54 - column 6, line 14) arranged above it, characterized by using: a diffuser (16; Figure 2,5; column 5, line 54 - column 6, line 14; column 7, lines 49-68) formed by a cap (16; Figure 2; column 5, line 54 - column 6, line 14) supplied by a central dome-piece (28; Figure 2; column 5, line 54 - column 6, line 14) connected to a symmetrical annular distribution chamber (80; Figure 2; column 5, line 54 - column 6, line 14) – claim 1. Applicant’s claim 1 requirement of “Improved reaction chamber for an epitaxial reactor” is an intended use claim requirement. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Conger further teaches:

- i. Conger’s cylindrical zone (upper portion of 112) of Conger’s belljar (“quartz dome”, 112; Figure 5; column 5, line 54 - column 6, line 14) extended above Conger’s plate (lower portion of “quartz dome” above 114; Figure 5; column 5, line 54 - column 6, line 14) supported above Conger’s susceptor (114; Figure 5) so as to eliminate any interference between Conger’s plate (lower portion of “quartz dome” above 114; Figure 5; column 5, line 54 - column 6, line 14) and shoulder (curved upper portion of 112;

Figure 5); a minimum internal diameter of Conger's belljar ("quartz dome", 112; Figure 5; column 5, line 54 - column 6, line 14) so as to keep Conger's belljar ("quartz dome", 112; Figure 5; column 5, line 54 - column 6, line 14) as far away as possible from Conger's susceptor (114; Figure 5; column 5, line 54 - column 6, line 14) – claim 1

- ii. Reaction chamber (Figure 5; column 7, line 48-68) for Conger's epitaxial reactor, according to Claim 1, characterized in that Conger's cap (16; Figure 2; column 5, line 54 - column 6, line 14) of Conger's diffuser (16; Figure 2,5; column 5, line 54 - column 6, line 14; column 7, lines 49-68) is fixed to Conger's annular flange (lowest portion of 16; Figure 2) which is in turn fixed to Conger's (upper-most portion of 12; Figure 2) of Conger's belljar ("quartz dome", 112; Figure 5; column 5, line 54 - column 6, line 14) by means of Conger's pair of two half counter-flanges (128; Figure 5) gripping Conger's annular flange (lowest portion of 16; Figure 2) against Conger's upper flange (16/112 interface; Figure 5) of Conger's belljar ("quartz dome", 112; Figure 5; column 5, line 54 - column 6, line 14), as claimed by claim 2
- iii. Reaction chamber (Figure 5; column 7, line 48-68) for Conger's epitaxial reactor, according to Claim 2, characterized in that Conger's cap (16; Figure 2; column 5, line 54 - column 6, line 14) is closed at Conger's top by a flange (28/16 interface; Figure 2) terminating in Conger's dome-piece (28; Figure 2; column 5, line 54 - column 6, line 14) communicating with Conger's sleeve (horizontal portion of 28; Figure 2; column 5, line 54 - column 6, line 14) for connection to Conger's external source of gas (56/36; Figure 1; column 5, line 54 - column 6, line 14) to be used in Conger's same reaction chamber (Figure 5; column 7, line 48-68), which dome-piece is provided with Conger's bottom

- (piece above 86; Figure 2; column 5, line 54 - column 6, line 14) defining at least one circular slit (88; Figure 2) for ensuring Conger's rigorously uniform distribution of gas to Conger's annular chamber (80; Figure 2; column 5, line 54 - column 6, line 14) – claim 4
- iv. Reaction chamber (Figure 5; column 7, line 48-68) for Conger's epitaxial reactor, according to Claim 4, characterized in that, in addition to Conger's slit (88; Figure 2) in Conger's bottom (piece above 86; Figure 2; column 5, line 54 - column 6, line 14), Conger's further annular slit (88; Figure 2) helps ensure Conger's uniform distribution of gas to Conger's annular chamber (80; Figure 2; column 5, line 54 - column 6, line 14) – claim 5

Conger does not teach:

- i. Conger's symmetrical annular distribution chamber (80; Figure 2; column 5, line 54 - column 6, line 14) has a plurality of pipes of the same length which connect Conger's annular chamber (80; Figure 2; column 5, line 54 - column 6, line 14) of Conger's cap (16; Figure 2; column 5, line 54 - column 6, line 14) to Conger's dome zone (112; Figure 5) of Conger's belljar ("quartz dome", 112; Figure 5; column 5, line 54 - column 6, line 14) situated just underneath Conger's neck (upper portion of 112; Figure 5; column 5, line 54 - column 6, line 14) connecting Conger's upper flange (16/112 interface; Figure 5) to Conger's dome (112; Figure 5) – claim 1
- ii. the plurality of pipes ensuring a uniform distribution of flow at a lower speed – claim 1
- iii. on Conger's corners of Conger's susceptor (114; Figure 5; column 5, line 54 - column 6, line 14), in its upper zone, projecting baffles inserted into recesses formed in Conger's body of Conger's susceptor (114; Figure 5; column 5, line 54 - column 6, line 14), the

- baffles having a length about half that of the corners of Conger's susceptor (114; Figure 5; column 5, line 54 - column 6, line 14) – claim 1
- iv. a plurality of pipes emerging from Conger's distributor (16; Figure 2; column 5, line 54 - column 6, line 14) inside Conger's bell jar (112; Figure 5) – claim 4
 - v. outlet pipes – claim 5
 - vi. Reaction chamber (Figure 5; column 7, line 48-68) for Conger's epitaxial reactor, according to Claim 4, characterized in that Conger's cap (16; Figure 2; column 5, line 54 - column 6, line 14) of Conger's distributor (16; Figure 2; column 5, line 54 - column 6, line 14) comprises an internal chamber for a flow of a cooling fluid – claim 6
 - vii. Reaction chamber (Figure 5; column 7, line 48-68) for Conger's epitaxial reactor, according to Claim 4, characterized in that outlet pipes are made of a material which is chemically inert with respect to a gas used in Conger's belljar ("quartz dome", 112; Figure 5; column 5, line 54 - column 6, line 14) - claim 7
 - viii. Reaction chamber (Figure 5; column 7, line 48-68) for Conger's epitaxial reactor, according to Claim 7, characterized in that said outlet pipes are made of glass, as claimed by claim 8
 - ix. Reaction chamber (Figure 5; column 7, line 48-68) for Conger's epitaxial reactor, according to Claim 7, characterized in that said outlet pipes are made of ceramic material, as claimed by claim 9
 - x. Reaction chamber (Figure 5; column 7, line 48-68) for Conger's epitaxial reactor, according to Claim 7, characterized in that said outlet pipes are made of quartz, as claimed by claim 10

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- v. A Reaction chamber (Figure 5; column 7, line 48-68), according to Claim 1, characterized in that baffles fixed to Conger's susceptor (114; Figure 5; column 5, line 54 - column 6, line 14) are made of material chemically inert with respect to Conger's gases used in Conger's Conger's chamber, as claimed by claim 11

Tomoyasu, Masayuki et al teaches:

- xi. symmetrical annular distribution chambers (62, 44a-d; Figure 1) has a plurality of pipes (46, 64; Figure 1) of the same length which connect Tomoyasu's annular chamber (62, 44a-d; Figure 1) of Tomoyasu's cap (42) to Tomoyasu's dome zone (4) of Tomoyasu's -- claim 1
- xii. the plurality of pipes ensuring a uniform distribution of flow at a lower speed - Applicant's claim 1 requirement of "...the plurality of pipes ensuring a uniform distribution of flow at a lower speed..." is an intended use claim requirement. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02). The Examiner argues that there is no structural difference between the claimed invention's symmetrical annular distribution chambers with a plurality of pipes and the prior art symmetrical annular distribution chambers with a plurality of pipes

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- xiii. a plurality of pipes (46, 64; Figure 1) emerging from Tomoyasu's distributor (30) inside Tomoyasu's reactor (4; Figure 1) – claim 4
- xiv. outlet pipes (46, 64; Figure 1) – claim 5
- xv. Reaction chamber (4; Figure 1) for Tomoyasu's reactor, according to Claim 4, characterized in that Tomoyasu's cap (42) of Tomoyasu's distributor (30) comprises an internal chamber (82) for a flow of a cooling fluid – claim 6
- xvi. Reaction chamber (4; Figure 1) for Tomoyasu's reactor, according to Claim 4, characterized in that outlet pipes (46, 64; Figure 1) are made of a material which is chemically inert ("aluminum covered with the anodized surface"; column 5, lines 53-58) with respect to a gas used in Tomoyasu's reactor - claim 7
- xvii. Reaction chamber (4; Figure 1) for Tomoyasu's reactor, according to Claim 7, characterized in that said outlet pipes (46, 64; Figure 1) are made of glass ("aluminum covered with the anodized surface" – Al_2O_3 ; column 5, lines 53-58), as claimed by claim 8
- xviii. Reaction chamber (4; Figure 1) for Tomoyasu's epitaxial reactor, according to Claim 7, characterized in that said outlet pipes (46, 64; Figure 1) are made of ceramic material ("aluminum covered with the anodized surface" – Al_2O_3 ; column 5, lines 53-58), as claimed by claim 9

Pozzetti teaches:

- xix. a susceptor (132; Figure 8) projecting baffles (147a-f; Figure 8) inserted into recesses (146a-f/147a-f interfaces) formed in a body of the susceptor (132; Figure 8), the baffles

having a length (compare Figure 1 of Applicant's invention with Figure 8 of Pozzetti) about half that of the corners of the susceptor – claim 1

- xx. A Reaction chamber (12; Figure 1), according to Claim 1, characterized in that baffles (147a-f; Figure 8) fixed to Pozzetti's susceptor (132; Figure 8) are made of material chemically inert with respect to Pozzetti's gases used in Pozzetti's chamber, as claimed by claim 11. Applicant's claim 11 requirement of "are made of material chemically inert with respect to gases used in the chamber" is an intended use claim requirement. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).
- vi. A Reaction chamber (12; Figure 1), according to Claim 1, characterized in that baffles (147a-f; Figure 8) fixed to Pozzetti's susceptor (132; Figure 8) are made of material chemically inert (column 8, lines 18-22) with respect to Pozzetti's gases used in Pozzetti's chamber, as claimed by claim 11

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Conger to add a plurality of pipes of the same length as taught by Tomoyasu, replace Conger's susceptor with Pozzetti's susceptor having projecting baffles inserted into recesses formed in Pozzetti's body of Pozzetti's susceptor as taught by Pozzetti, add an internal chamber

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to Conger's distributor for a flow of a cooling fluid as taught by Tomoyasu, and dimension Conger's chemically resistant plate to be partially flat.

Motivation for Conger to add a plurality of pipes of the same length as taught by Tomoyasu is for uniform process gas application as taught by Tomoyasu (column 8, lines 22-32), replace Conger's susceptor with Pozzetti's susceptor having projecting baffles inserted into recesses formed in Pozzetti's body of Pozzetti's susceptor as taught by Pozzetti is for maintaining uniform film growth across process wafers as taught by Pozzetti (column 7, lines 37-40), add an internal chamber to Conger's distributor for a flow of a cooling fluid as taught by Tomoyasu is for maintaining the process gases at a predetermined temperature as taught by Tomoyasu (column 6, lines 55-67), and motivation to dimension Conger's chemically resistant plate to be partially flat is for optimizing Conger's gas flow as taught by Conger (abstract). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

6. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conger, Darrell R. (US 4,761,269 A), Tomoyasu, Masayuki et al. (US 5,888,907 A), Pozzetti, V et al (EP 415191 A) in view of Wu, Robert W. (US 5,910,221 A). Pozzetti further teaches graphite as a material for Pozzetti's susceptor (column 8, lines 4-6). None of Conger, Tomoyasu, and Pozzetti teach:

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- vii. Reaction chamber (12; Figure 1) for Pozzetti's reactor, according to Claim 11, characterized in that the baffles are (147a-f; Figure 8) fixed to Pozzetti's susceptor (132; Figure 8) are made of ceramic material, as claimed by claim 13
- viii. Reaction chamber (12; Figure 1) for Pozzetti's epitaxial reactor, according to Claim 11, characterized in that the baffles (147a-f; Figure 8) fixed to Pozzetti's susceptor (132; Figure 8) are made of quartz, as claimed by claim 14
- ix. Reaction chamber (12; Figure 1) for Pozzetti's reactor, according to Claim 11, characterized in that the (147a-f; Figure 8) fixed to Pozzetti's susceptor (132; Figure 8) are made of graphite lined with silicon carbide, as claimed by claim 15

Wu teaches chemically inert materials including ceramics, quartz, and silicon carbide for reactor components in harsh chemical environments (column 1, lines 11-33; abstract)

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Conger, Tomoyasu, and Pozzetti to replace their stated materials for the materials as taught by Wu.

Motivation for Conger, Tomoyasu, and Pozzetti to replace their stated materials for the materials as taught by Wu is for maintaining reactor chamber components inert to the processing environment as taught by both Pozzetti (column 8; lines 18-22) and Wu (abstract).

Allowable Subject Matter

7. Claim 3 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. None of the prior art teach or suggest "fixing of the cap of the

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diffuser to the annular flange is performed by means of a plurality of spring-loaded tie-rods which push in an elastic manner to the cap against the annular flange”.

Response to Arguments

8. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new grounds of rejection.

9. Applicant states:

“

The flat plate 40 serves to divert the flow of gases coming from the pipes 106 a-c of the diffuser 54, towards the shoulder 42 of the bell jar. In other words, the diffuser combined with flat plate and the shoulder of the bell jar provide for a new system of distributing the gas inside the reaction chamber of an epitaxial reactor.

“

In response, the Examiner believes that Conger also teaches a plate (lower portion of “quartz dome” above 114; Figure 5; column 5, line 54 - column 6, line 14) which serves to divert the flow of gases coming from Conger's pipes (18, 26, 28; Figure 5) of Conger's diffuser (16; Figure 2,5; column 5, line 54 - column 6, line 14; column 7, lines 49-68), towards the shoulder (curved upper portion of 112; Figure 5) of the bell jar. In other words, the diffuser combined with flat plate and the shoulder of the bell jar (112; Figure 5). However, as stated above, Conger's plate is not flat. The Examiner agrees, but believes that rendering Conger's plate flat is obvious to those of ordinary skill. Additionally, it has been established that the shape of a container is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive

evidence that the particular configuration of the claimed container is significant (In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) MPEP 2144.04).

10. In response to applicant's argument that Conger, Darrell R. (US 4,761,269 A), Tomoyasu, Masayuki et al. (US 5,888,907 A), and Pozzetti, V et al (EP 415191 A) are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the Examiner believes that all of the cited references are in the field of applicant's endeavor (gas distribution in wafer processing chambers) and are then be reasonably pertinent to the particular problem with which the applicant was concerned (uniform processing).

Conclusion

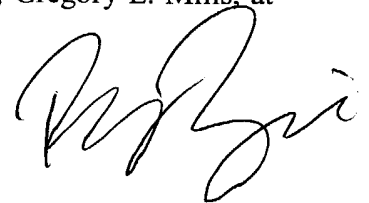
11. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after fax phone number for the 1763 art unit is (703) 872-9306. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (571) 272-1439.



12/13/4